



**LINKEDTV**



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## **Deliverable 6.5 Final Evaluation**

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Work Package 6: Scenarios

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<sup>1</sup> • PU = Public

- PP = Restricted to other programme participants (including the Commission Services)
- RE = Restricted to a group specified by the consortium (including the Commission Services)
- CO = Confidential, only for members of the consortium (including the Commission Services))

	<i>other aspects of the LinkedTV technologies in the trials, specifically the personalization and content curation.</i>
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## Glossary of terms

<b>Chapters</b>	A segment of a video episode, e.g. news item in a new boardcast, or a scene from a TV show. Used in the interface to help users navigate through content.
<b>Dimensions</b>	A category of enrichment. These can be scenario-dependant, e.g. “Related Artwork” in LinkedCulture, or “Related News” items in LinkedNews
<b>Enrichment(s)</b>	Additional or complementary information provided by the LinkedTV Player that relates to the content of the television program, for examples, entities or related chapters.
<b>Entity</b>	A person, place or other thing that is mentioned in the TV program. Often discussed within the context of the enrichments of the LinkedTV Player.
<b>LinkedCulture</b>	The cultural-themed scenario using content from the Dutch television show <i>Tussen Kunst &amp; Kitsch</i>
<b>LinkedNews</b>	The news-themed scenario using content from the RBB nightly news show.
<b>RBB</b>	Rundfunk Berlin Brandenburg
<b>S&amp;V</b>	The Netherlands Institute of Sound & Vision
<b>TKK</b>	Tussen Kunst & Kitsch
<b>UI</b>	User Interface
<b>WP</b>	Work Package

## History of the Document

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# 1 Introduction

In Spring 2014, the LinkedTV project developed fully functional prototypes of the LinkedTV scenarios – one with RBB news programs and the other with *Tussen Kunst en Kitsch* episodes courtesy of AVROTROS - and conducted three sets of “hands on” user evaluations to assess their general usability. The results of these evaluations, reported in D6.3, produced valuable feedback regarding user interface issues such as navigation and video playback control as well as the organization and display of enrichments inside the player. Such information was instrumental during the execution of another iteration of the design cycle for LinkedTV applications.

With LinkedTV in its final year, the advanced stage of the project and the redesign of the LinkedTV approach to enrichment and content browsing in the player following the past evaluation allow us one last opportunity to validate with our target users if now LinkedTV has achieved its goal in satisfying their needs. This report covers the procedures and results of two final evaluations:

- The first is designed to focus upon one of the most essential contributions (that is, in terms of the added value it gives our end-users) of the LinkedTV Project as a whole: the enrichments that appear in the LinkedTV Player. These evaluations, led by the National Institute of Sound & Vision, placed participants in a laboratory setting where they interacted with cultural and educational television content for approximately an hour. Data were collected on a range of topics, but primarily the perceived usefulness and interest in the enrichment in the player. In this document, these are referred to as the **LinkedCulture Trials**.
- The second evaluation is designed to be as ambitious as possible in terms of scope, requiring the active participation of all Research, Development, and Exploitation work packages. It features participants in the role of editors curating a nightly news show and producing content for other participants in the role of end-user using the LinkedTV player to observe the content. These evaluations were coordinated by RBB and took place primarily in the user’s respective homes during the evenings. As these evaluations employ the highest possible level of fidelity to the proposed scenarios, they provide important qualitative data into the entire LinkedTV experience. The evaluations are referred to as the **LinkedNews Trials** in this document.

Alongside these evaluations, scenario partners supported actively two additional evaluations, focused on content curation and content personalisation. These evaluations examined the **Editor Tool** (i.e. the platform designed to curate suggested enrichments for the end user) and the **Personalisation** features of the LinkedTV Player (where enrichments selected by the editor are ranked and filtered for the user according to their interest profile). These tools were both assessed during the LinkedNews Trials, but given that the LinkedNews Trials were designed for breadth, the respective work packages of the Editor Tool and the Personalisation features have also led their own trials to more deeply assess their

contributions – these are reported in detail in the respective deliverables D1.6 and D4.7. In this deliverable, we will report on:

- Establishing the overall goals of these final trials (Section 2)
- The definition and set-up of each of the trials (Section 3)
- The execution of the trials and collecting and analysis of their results (Section 4)
- A summary of our findings and our outlook for the LinkedTV scenarios (Section 5)

## 2 Goals of the Final Scenarios Evaluation

Before outlining the procedures and protocols of the user trials, it is important to discuss the motivation behind the final round of evaluations and their strategic role in the LinkedTV project.

### 2.1 Project and Work Package Goal

The work for this deliverable began with an informal brainstorming session on the project wiki where members<sup>2</sup> shared their ideas and proposed objectives for the final round of user evaluations. Recognizing that this would indeed be a summative evaluation (rather than a formative evaluation that would go on to influence further design and technical implementation), members agreed that their motivation would be centered upon:

- 1) Measuring the user acceptance of LinkedTV as a consumer product
- 2) Placing users in a “real-world” scenario (as much as possible) to collect the most accurate information

Discussion of how to best measure user acceptance of LinkedTV required that members identify the core feature or features that contributed the most added value to the user's television watching experience. This was determined to be the enrichments that are available through the LinkedTV player which provide complementary information to the events unfolding in the television program. Therefore, we developed a procedure involving usage trials and a series of questionnaires and interviews for participants that measured primarily their perceived interest in and satisfaction with enrichments. The questionnaires also included questions about the market viability of the product thanks to the involvement of University of St. Gallen from the Exploitation work package.

Addressing the second point of motivation, members identified two different strategies for placing participants in a “real-world” scenario. The first idea was to create a laboratory setting that included a TV set and tablet prototype of the LinkedTV player that would allow us to validate several different interaction models: i.e. the second screen experience of using two devices at once vs. request enrichments on the same screen as viewing (basic Hobbit setup). Alternatively, a second proposition focused more on the dimension of time, allowing participants to use the LinkedTV application in their home in the evening over a period of several days. This model of interaction was created with viewing habits of nightly news content in mind, and therefore it would also require a daily editorial and curation element to prepare the content for the participants. The evaluations would be long enough in duration to

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<sup>2</sup> These discussions involved a broad group of project consortium members since the final scenarios make use of the full technology workflow of LinkedTV. The main organisations involved in the evaluation planning and support, in no particular order have been Sound and Vision, RBB, MODUL, EURECOM, CERTH, CWI, and U St Gallen. CONDAT and NOTERIK ensured the technical infrastructure was in place throughout the evaluation period.

test personalisation functionality of the player which adapts to the user's behavior and preferences over time. With long periods of interaction, users would also become deeply acquainted with the tool itself, allowing them to provide in-depth and insightful feedback. Such evaluations would also validate the LinkedTV workflow as a whole and serve as a backbone for coordinated participation from different project partners, so that they may work toward validate their own goals inside a real-world scenario.

Given the differences in potential user's personal home setup and the high number of variables at play in terms of technical implementation, it would have been unrealistic to pursue an evaluation which combined this time intensive quality with an extensive second screen set-up. With these constraints in mind, we chose to pursue the longitudinal (i.e. running for a long period of time) evaluation and use only the LinkedTV player stand-alone prototype. This trade-off preserves the entire LinkedTV workflow from curation to consumption, which is essential for involving as many other project goals as possible.

These two evaluations, LinkedCulture and LinkedNews, complement each other in their design along multiple dimensions: brief and protracted time intervals, news and cultural content, breadth and depth of observations. These complementary experiments will allow us to analyse and reflect upon the LinkedTV experience and provide outlook with as much evidence as possible.

## 2.2 Goals of the LinkedCulture Trails

From the previously held focus group and usability tests, we had learned about user's specific information needs and usability issues that needed to be solved<sup>3</sup>. Thus, for these final trials with the final iteration of the LinkedCulture application we wanted to consolidate these two outcomes and evaluate:

1. The participant's interest in the newly developed 'dimensions' (i.e. the categories of enrichment), namely Related artworks (Europeana content), Related chapters (content-to-content linking), Background information (more in-depth information from the white list) and About (general info about the art object shown in a chapter).
2. The participant's assessment of the quality of the enrichments in these dimensions.
3. The usability of the application.

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<sup>3</sup> Stanoevska, Katarina, Frederic Junker, Mar Rodriguez, Lotte Belice Baltussen, Evelien Wolda, Mieke Leyssen. 2014. User Trial Results. LinkedTV Deliverable 6.3.

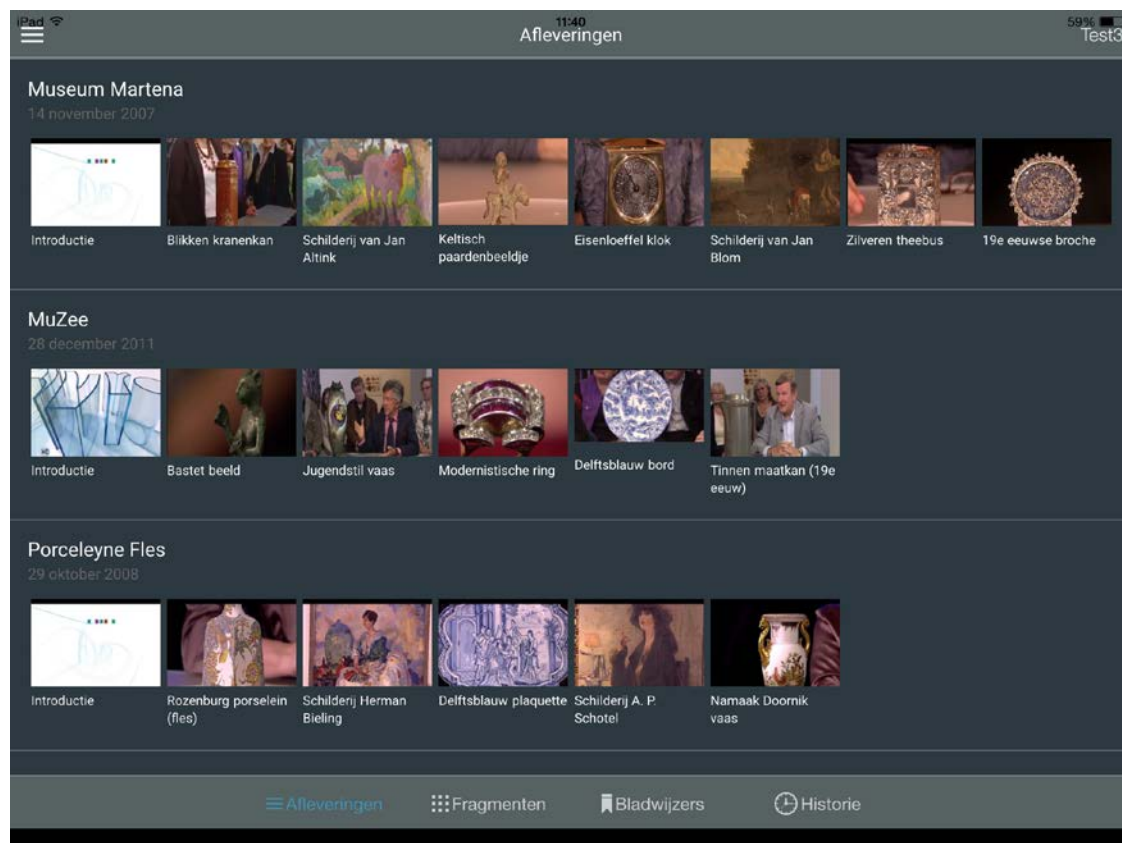


Figure 1: Home screen of LinkedCulture - showing the fragments of the three most recently added episodes (*Museum Martena*, *MuZee*, *Porcelain Files*).

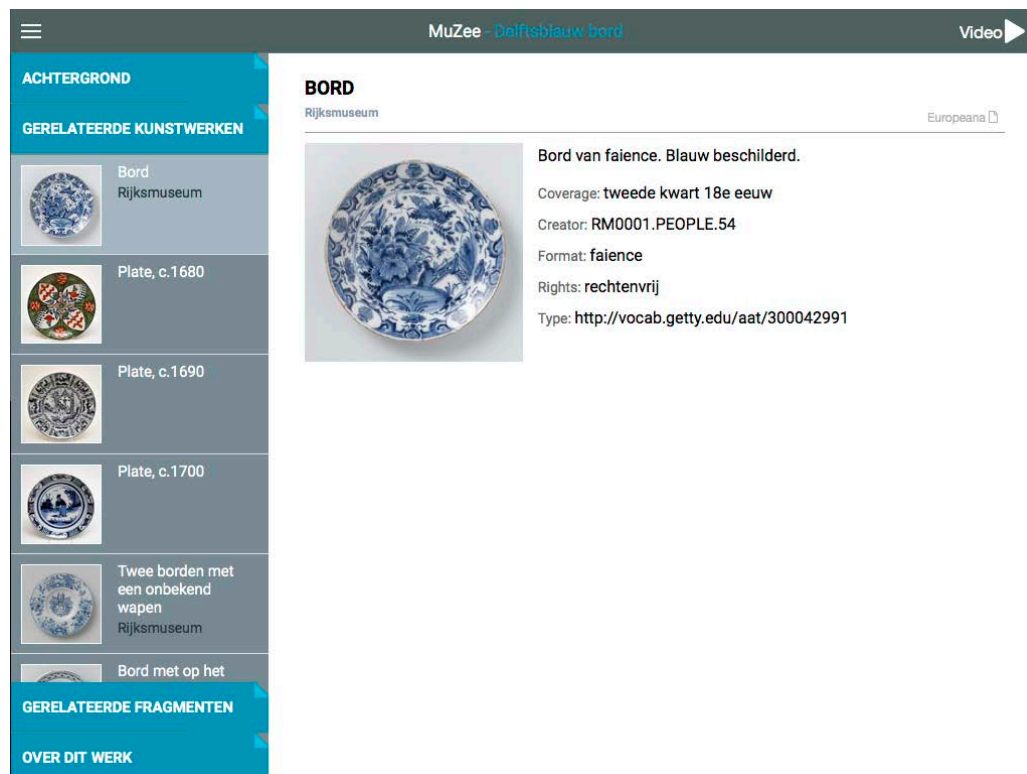


Figure 2: Exploring the Related Artworks dimension in LinkedCulture - with enrichments coming from Europeana. The other dimensions of enrichment are Background (Achtergrond), Related Fragments (Gerelateerde Fragmenten) and About (Over dit werk).

## 2.3 Goals of the LinkedNews Trials

Throughout the LinkedTV project there have been several evaluation sessions in laboratory situations with professional and end users, which brought valuable information into our design cycles. Now at the end of the project the collaborating partners agreed to conduct a longitudinal test with both professional users for the Editor Tool and end users for the Linked News application.

The LinkedNews tests at RBB had a number of motivations coming from various perspectives:

1. Acceptance – End User: Do End Users still see the LinkedNews service as an added value compared with already available services and which device or combination of devices would they prefer to use? We also investigated whether they would be willing to pay for such a service.
2. Acceptance – Professional User: Do Editors experience the LinkedTV system as a promising support in their daily work and would they be interested in using the system or parts of it to create LinkedTV services or to improve their everyday work.
3. Technologies – End User: As there had been multiple user tests on the Service UI this played a minor role in the test, i.e. testers were not explicitly asked but respective comments were forwarded to the UI developer. On the other hand, personalisation was one of the core motivations for the longitudinal tests; partly because useful information in this field requires numerous actions of the user side, partly because personalisation features must be neatly integrated in the user experience. User acceptance of personalisation in general and LinkedTV's policy in particular also played an important role.
4. Technologies – Professional User: A further motivation for the longitudinal tests was to get “real life” experience concerning performance, robustness and coherence of the implemented workflow. How long does it take to edit a programme and is that an acceptable amount of time and effort from a professional view?

### 3 Evaluation design and set-up

#### 3.1 LinkedCulture evaluation design and protocol

The Netherlands Institute for Sound and Vision was responsible for the LinkedCulture trials. The content of the application is *Tussen Kunst & Kitsch* television programme<sup>4</sup> (similar to BBC's *Antiques Roadshow*) of Dutch broadcaster AVROTROS. The participants recruited for the trials had to either know or watch *Tussen Kunst & Kitsch* (henceforth: TKK), or have an interest in cultural programmes in general. Furthermore, participants were required to own or at least know how to operate a tablet, as otherwise the tests would be too frustrating.

Participants were recruited via Sound and Vision's website<sup>5</sup>, social network channels<sup>6</sup> and by asking previous participants of the focus group and usability tests to participate (if they had agreed to be contacted in the future). They could sign up through an online form (Appendix D) in which they were asked to give information on their age, interest in cultural heritage programmes, media literacy, second screen usage and availability. In total, 10 people signed up, 9 of whom previously participated either in the focus group or the usability tests. In the end, 8 out of the 10 people could actually participate.

**Table 1: Overview of trial participants at S&V**

User code	Gender	Age	Occupation	TKK viewer
TKK1	male	64	Retired / volunteer work	(almost) always
TKK2	male	69	Municipal council worker	regularly
TKK3	female	67	Freelance ghostwriter/editor and secretary	sometimes
TKK4	male	65	Jurisconsult/retired	regularly
TKK5	female	66	Primary school teacher (currently retired)	(almost) always
TKK6	female	67	Retired	sometimes
TKK7	female	60	Librarian	sometimes
TKK8	female	44	Journalist & writer	(almost) never

Each user trial was held on S&V's premises and lasted a maximum of 60 minutes and followed the following protocol:

1. The moderator and the observer, both LinkedTV researchers conducting the user trials, introduced the participant to the aims and scope of the LinkedTV project and explained the goal of the trial.
2. The participant filled out a consent form (Appendix B).

<sup>4</sup> <http://avro.nl/tussenkunstenkitsch/>

<sup>5</sup> <http://www.beeldengeluid.nl/blogs/research-and-development/201501/test-ons-tweede-scherm-voor-tussen-kunst-kitsch>

<sup>6</sup> <https://twitter.com/lottebelice/status/560781791485652993>

3. The participants got four assignments (Appendix A), ranging from very general (indicate what you see and notice regarding the application's home screen) to more specific (explore the dimensions and the enrichments). The observers wrote down the actions and opinions of the participant. For this, the talk-aloud method was used. This requires that participants had to speak out loud about what they did, why they did it and what they were thinking while they were doing it. If needed, the observers also asked questions that enabled users to clarify their understanding and opinions. At S&V, the discussion with the participant was captured with a voice recorder app on a mobile phone to ease analysis of the user trials' results.
4. After the assignments, a short interview was held with the participants to summarise the test and make them reflect on what they saw. They also filled out a short online survey about their interest in purchasing the application (Appendix C).
5. At the end, all participants were given a €20 voucher and their travel costs were reimbursed.

The general methodology described above was followed, and the moderator (Lotte Belice Baltussen, S&V) was always accompanied by an observer (Dimitra Atsidis, S&V). A more complete version of the protocol can be found in Appendix A: LinkedCulture Protocol.

## 3.2 LinkedNews evaluation design and protocol

RBB was responsible for the first phase of LinkedNews test, i.e. for the selection and curation of content and for the conduction of the longitudinal test from 2-6 March 2015 in Berlin and Brandenburg. For this week, every day in the morning an editor would use the LinkedTV system to curate the previous day's show of RBB AKTUELL. In the afternoon this show was made available to the end user test panel who used the current LinkedNews application provided by CWI on their tablets.

MODUL University set up a second test user panel which used the same content as the German testers, i.e. the RBB news programmes of 02-06 March 2015, and the same tablet application.

### 3.2.1 Motivation

The main conclusions we wanted to draw from the final evaluation were:

#### End User Tests:

1. Perceived added value, which included:
  1. The Quality of enrichments;
  2. Utility: Is a LinkedNews Service perceived as useful and an added value compared to other means of getting the same information?;
2. Preferred devices: If users find such a service interesting, would they prefer to consume extra information on



1. TV only,
  2. tablet only,
  3. two screen/second screen,
  4. multiscreen;
3. Personalisation:
1. Do the implemented personalisation options add value to the service?

### Professional User Tests:

1. Satisfaction with automatic system suggestions for entities and other enrichments
2. Potential use of services and technology beyond the end of the project
3. Usability of the second version of the editor tool (ETv2)

The protocol and results of the professional user tests will be further described below in Section 3.3.2 Editor Tool trials. The following sub-sections of 3.2 will focus on the end user tests.

### 3.2.2 Participants

RBB's R&D Team (rbb Innovationsprojekte) has a database of users who agreed that they would generally be interested in participating in user tests for the various technologies developed in RBB's projects. From this list a number of users were invited to participate in the tests described here; selection criteria were

- a) an interest in news
- b) access to a tablet
- c) availability during the test week
- d) an interest in participating in this test.

Six test users agreed to participate. They were given fictional user names which they used throughout the test (see table below). The only point where their real names came into play was when they had to sign the Informed Consent Forms).

**Table 2: Overview of trial participants at RBB**

User code	Gender	Age	Occupation
Harry	male	32	Teacher
Martha	female	30	Municipal council worker
Lisa	female	54	Freelance multimedia editor
Marvin	male	43	Research-and-development
Steve	male	28	Freelance software developer
Annie	female	26	Office assistant

### 3.2.3 Protocol Overview

The End User Evaluation consisted of three phases:

1. Face-to-Face Interviews: Introduction to the service, Lab test with demo of Multiscreen prototype (HbbTV and tablet), introduction to LinkedNews tablet service, preparation of tablets for phase 2
2. "Longitudinal" test: Users take home tablets and use the service at home for a week
3. Email questionnaire: Feedback about the experience using the service and potential improvements

The detailed protocol and questionnaires can be found in Appendix E, but the following sub-chapters will provide an overview of the procedure and results.

### 3.2.3.1 Test Phase 1: Introduction to LinkedTV and First Questionnaires

For the kick-off of the LinkedNews User Evaluations all participants received an introduction to RBB Innovationsprojekte as the hosting organisation, then to the general concept of LinkedTV and the specific strategy of LinkedNews. Based on a presentation of the multiscreen service, which combines basic information on the HbbTV screen with detailed information to explore on the tablet, users were asked what they thought about the service through a questionnaire.



**Figure 3: The LinkedNews Multiscreen Scenario**

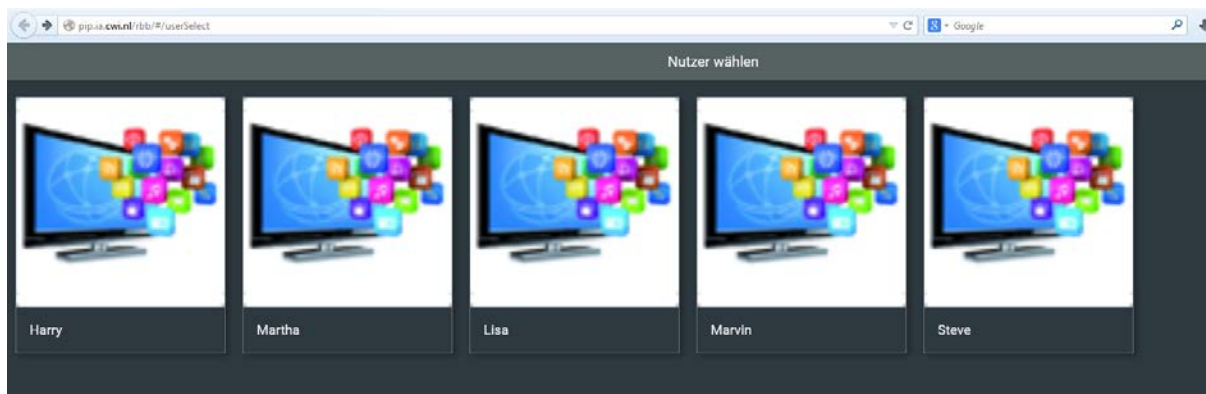
The results of this and all other questionnaires can be found in Section 4.2 LinkedNews scenario. After this first questionnaire test users were introduced to the procedure of the longitudinal test.

### 3.2.3.2 Test Phase 2: The LinkedNews Player and the Longitudinal Test

Having had a first impression of the goals of the LinkedNews service and the multiscreen scenario concept, testers were asked to take out their test equipment (in this case, their own personal iPads and Android tablets), enter the URL of the test service and bookmark this so called LinkedNews Player as they would need to access this site multiple times throughout the following week.

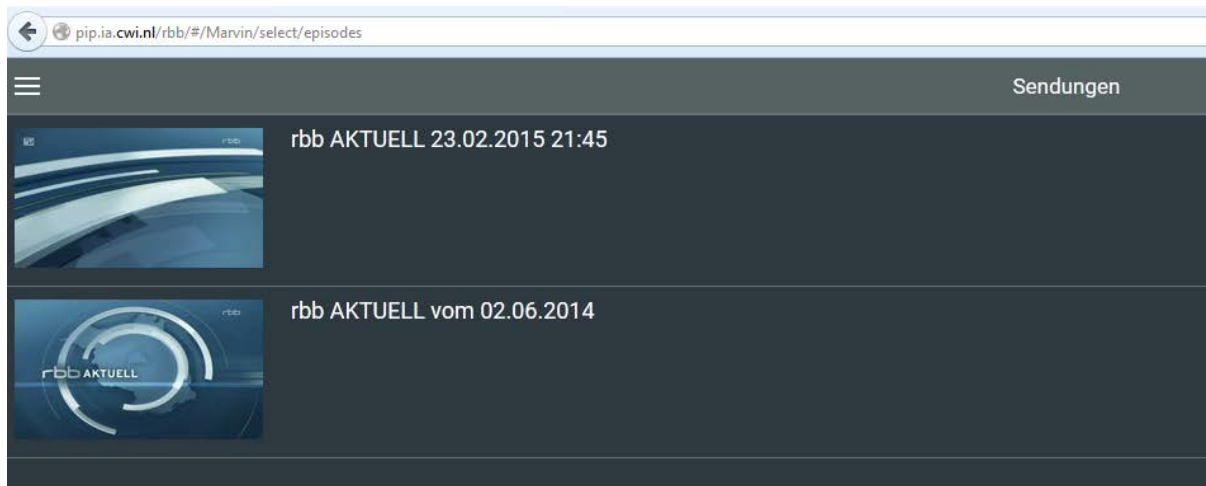
The host and the testers together went through a manual that described a step-by-step walkthrough explaining how to use the player and what the participants would be expected to do during the evaluation:

To begin, each test user selects their corresponding login according to their user code:



**Figure 4: Log in screen showing five different accounts of the participants.**

Then, every day from 14h00 onwards, test users would find a new show of RBB AKTUELL in the player.



**Figure 5: Episode selection screen (after log in screen)**

To cater to the needs of all partners involved in the evaluation, testers were asked to first watch all news items (or “chapters” in LinkedTV Terminology) and rate how interesting they find each topic.



**Figure 6: Rating interests using star icons in the episode list on the left.**

After having rated the general relevance of all chapters, the participants were expected to revisit every news chapter again, but this time in Explore mode. Explore mode lists all the enrichments of a chapter in three separate dimensions: Additional Information, Background, and Related Content.



**Figure 7: Additional RBB News chapters providing background information to the user in Explore Mode**

Eventually, each of the available enrichments were to be rated in terms of how interesting or enriching they were perceived to be.

After this first initial training session, the remainder of the sessions occurred at the participants own home to better simulate a real-world environment. Every test participant took home the manual and used the bookmarked link to access the service and repeat the procedure above. This test was repeated for five days in a row, i.e. from Monday, March 2<sup>nd</sup> until Friday, March 6<sup>th</sup>, 2015.

### 3.2.3.3 Test Phase 3: Final Questionnaire

The tests were concluded with a questionnaire, which was distributed by email for the convenience of our participants.

This final questionnaire aimed at an evaluation of:

1. The overall service satisfaction and whether a single screen or multiscreen service would be preferred;
2. Economical issues, e.g. whether people would be willing to pay for such a service and if so how much;
3. Personalisation and content sharing issues, such as whether users would allow their data to improve content recommendation, etc.

The results of the above tests will be summarized in their respective chapters below.

## 3.3 Related User Evaluations

LinkedNews was designed to take prospective users through an enriched television experience. The overhead required to create such an expansive evaluation meant that only eight participants (2 editors and 6 consumers) could take part in the trials. Such a small number of participants made it difficult to provide a more in-depth and focused analysis of certain features of the prototype that were provided by other work packages. Therefore, additional evaluations were conducted where more participants went through similar but more focused evaluations to create more trial results concerning specific features of the LinkedTV technologies.

In this section, we will present evaluations that were designed to complement the LinkedNews trials with regard to certain aspects of the prototype. These include the **Personalisation** trials and the **Editor Tool** trials. The descriptions here are meant to be brief and illustrative to give the reader a full understanding of what research was conducted with the scenarios provided in WP6. These evaluations are fully described in their respective deliverables: D1.6 and D4.7.

### 3.3.1 Personalisation trials

The LinkedNews evaluations required a significant and timely effort in curation so that nightly news content was ready for consumers the following day. The participants went through the content over a period of several days, which also enabled the testing of personalisation

features. The first three days of the evaluation were used to build each user's personalized profile, while the last two days were used to gather data in order to test the profile.

In the week following the LinkedNews trials, additional Personalisation trials were conducted at MODUL University. These trials took five additional participants through the same content, (i.e. the five RBB news programs that were curated the week prior) providing additional data cases for the personalisation feature.

The five participants were chosen from employees at MODUL University who had a high level of language comprehension in German and English (the content was in German while the test was conducted in English) and who had no prior knowledge of the LinkedTV web player. During a morning session, the five participants watched three videos of the broadcast and rated their interest in the video chapters as well as the enrichments in the "explore" section of the videos. During an afternoon session, the same five participants watched two more videos and were instructed to evaluate their impression of how well the personalisation system gave recommendation according to their interests given in the morning session. The sessions ended with a questionnaire asking six multiple-choice questions about the personalisation features. Each question also provided space for additional comments.

The results of the personalization trials can be found in D4.7, Section 4.3.

### **3.3.2 Editor Tool trials**

In the LinkedNews trials, one editor from RBB underwent training and curated episodes of the news broadcast using the Editor Tool. As this provides only one data case, more comprehensive Editor Tool trials were designed to have seven more participants evaluate the tool and provide qualitative feedback on the following subjects:

1. Usability of the automatically produced data as it was presented in the Editor Tool.
2. Usability of the automatically produced data in general.
3. Relevance of the offered functionality for the participants' work.

As shown in Table 3, these trials were held with media professionals from both Netherlands Institute for Sound and Vision (S&V) and Rundfunk Berlin Brandenburg (RBB). Their professions included media researchers, archivist (those responsible for adding metadata to AV content) and media managers (those who publish archived content online).

**Table 3: Profiles of eight participants from the Editor Tools test.**

User code	Occupation	Category	Organization
ET1	Media manager	Archivist	S&V
ET2	Media manager	Publishing	S&V
ET3	Project assistant incultural heritage	Research	S&V
ET4	Inflow manager	Archivist	S&V
ET5	Media manager	Publishing	S&V
ET6	Media manager	Publishing	S&V
ET7	Media history specialist	Publishing	S&V
ET8	News Editor	Programme editor	RBB

At S&V, the evaluations began with a short introduction to the LinkedTV Project as well as a demonstration of the LinkedTV end-user application and the Editor Tool itself. After consent forms were signed, the user was given a task list instructing them to perform enrichment on several chapters (create art objects, add background information, add related art objects, add related chapters). Participants were instructed to think aloud and share their thought process as they worked. The user trial moderator also took notes and recorded the audio from the session. The protocol ended with an exit questionnaire that was completed by the participants.

At RBB, the user trial with ET8 (see Table 3) had a very similar protocol except with many more tasks spread over the course of several days, and much more technical assistance for the participant provided by the editor. This was because ET8 actually produced real content that was used in the LinkedNews Trials.

The evaluations of the editor tool also included more informal input from four LinkedTV project members who worked with the tool extensively to provide content for the evaluations.

The results of the Editor Tool trial are in D1.6, Section 6.

## 4 Evaluation results and analysis

### 4.1 LinkedCulture scenario

After all eight trials were held, the individual remarks of the participants were compiled and compared with each other. This resulted in a list of 54 remarks that were made by one or more participants, about the dimensions, the enrichments in the dimensions, the interface, the concept of the application, and suggestions for future work.

#### 4.1.1 Dimensions

The LinkedCulture application has four different dimensions related to the artwork shown in a TKK fragment:

- About: shows the general properties of the object (e.g. the type of material and the general time period it is from) and links to the Wikipedia pages of these properties;
- Background: in-depth texts or videos related to the object;
- Related artworks: artworks from Europeana related to the art object;
- Related fragments: fragments from the TKK archives related to the art object.

The order in which the dimensions were shown was switched around per each set of participants to qualitatively gauge if they would automatically focus on the order presented to them or have a personal preference, despite the order. The original order and indicated preference during the trial and in the concluding interview per participant is shown in Table 4.

**Table 4: Original order of dimensions and indicated preference per LinkedCulture trial participant. Abt = About, B = Background, Art = Related artworks, Fr = Related fragments**

User code	Original order	Preference
TKK1	Abt/B/Art/Fr	B/Art/Fr/Abt
TKK2	Abt/B/Art/Fr	B/Art/Fr/Abt
TKK3	B/Art/Fr/Abt	B/Art/Fr/Abt
TKK4	B/Art/Fr/Abt	B/Art/Fr/Abt
TKK5	Art/Fr/B/Abt	Fr/Art/B/Abt
TKK6	Art/Fr/B/Abt	Art/B/Fr/Abt
TKK7	Fr/B/Art/Abt	Art/Fr/B/Abt
TKK8	Fr/B/Art/Abt	Abt/Art/B/Fr

Although it only examines a small set of participants, it is clear that save for one user, nobody wanted to see the general 'About' dimension first. Even the participant that indicated to want to see the more general information about the object presented in a fragment first stated that "generic information about for instance a time period like '18th century' is not very interesting". This was reflected by the comments of all other participants: they deemed 'About' to be too non-specific. Participants want to know more about the story behind the object and other relevant information, such as an object's value and other art styles that were popular in the period that an object was made.



The three other categories: Background, Related Artworks and Related Fragments were however very much appreciated, with Related Artworks unanimously mentioned as a great feature. Despite this appreciation, the participants do not necessarily want to see this dimension first. Half of them indicated to first want to read or see more background information related to the fragment they just watched, followed by Related Artworks for more context, and finally Related Fragments to explore the TKK archives further. That being said, these four participants either started with About (which they didn't care for that much in its current form) or with Background, most likely guiding their interest towards the Background. Three other participants, who either saw Related Artworks or Related Fragments at the top of the dimensions had a more varied preference for the order of the dimensions; one person that was first shown Related Artworks preferred seeing the Related Fragments first, since she likes watching video, whereas another had the exact opposite preference.

#### 4.1.2 Enrichments

Within the dimensions, users are presented with enrichments. In the 'About' dimension this consists of Wikipedia links of the general properties of the objects, in Background it concerns links to a white list of websites (e.g. Dutch museum websites, Wikipedia, other online videos of AVROTROS besides TKK), in Related Artworks users see objects from Europeana and in Related Fragments other TKK fragments.

Users were most happy when there was a good balance in the provided information. With regards to the description of a specific exhibition on painters from Dordrecht (a city in Holland) by the Dordrecht's Museum related to a fragment about a painting made by an artist from the city, one participant remarked: "Good information, not too much, not too little".

With regards to the Europeana enrichments showing art objects, participants really appreciated that they saw to which museums or other heritage organizations the objects belonged. One participant said about a painting from the Rijksmuseum: "It makes me wants to plan a visit". However, the varied quality of the Europeana data and descriptions and the different languages in which the metadata is presented was an issue for the participants.

Participants also agreed that for both Related Fragments and Related Chapters the provided images or thumbnails should be much bigger and fill the screen, in order to enhance the quality of LinkedCulture.

Everyone appreciated the information most closely related to the object the best. Thus, a background article on a museum website on contemporaries of the creator of an object is highly rated. This also goes for similar objects from Europeana or TKK's fragment archive that bear a strong resemblance to the Delftware plate in the fragment they watched.

What participants missed was seeing why a certain enrichment was related to the object presented in the TKK fragment. For the About dimension, the highly generic nature of enrichments was not appreciated by any user, and half indicated they missed seeing the value of the object. Especially with regard to Related Fragments, it was sometimes unclear whether another object was relevant because it was either by the same creator, had the

same art style or was from the same period (or a combination of these things). Making this more explicit would make them more likely to look at an enrichment. Furthermore, they would like to see an overview of (Dutch) museums in which works by an artist and/or related works can be found.

#### **4.1.3 Interface**

In general, the calm gray-and-blue interface is very much appreciated by participants. Upon seeing LinkedCulture at the beginning of the trial for the first time, one person's first remark was: "It looks nice!". Some participants did state that the differences between some of the grey-on-grey contrast is sometimes a bit hard to make out.

The home screen of the application was well-received: seven of eight participants really liked the fact that the thumbnail images of the artworks presented in the various fragments made them curious and that they were detailed enough to get an idea of what to expect. This indicates how vital it is to visually communicate with clear images in order to make an application like LinkedCulture attractive. This ties in with the comment made above about the enrichments: six out of eight participants were disappointed that the images in the Related Artworks and Related Fragments enrichments were so small.

With regards to the progress bar of the video player, two people explicitly indicated they expected to see the in- and outpoints of the fragment they were watching within the context of the entire episode.

#### **4.1.4 General concept**

All participants like the idea of getting very specific and surprising information related to cultural programmes. They like the possibility to learn more about art, see related objects from either Europeana or TKK's archives and references to museums in which specific objects can be found the most.

They do indicate that they would like to see a higher percentage of specific information, but that less is more. So: only four enrichments that really tell the story about an object or some of its specific properties would be appreciated more highly than eight more generic enrichments.

Seven participants state that the concept could also be used for different types of content, such as (nature) documentaries, travel shows, health programmes, other cultural videos, news events, theatre, photography, museum visits, skating events, soaps, and even for medical purposes in hospitals. One person even remarked: "I can't remember seeing something like this anywhere else."

#### **4.1.5 Suggested additional functionalities**

Six participants state that they want to be able to search or browse to the vast archive of fragments from the TKK archives (the show has been on TV since 1984), using filters such as type of material, art style and creators.

Seven participants have very specific, personal interests; e.g. some like Impressionist paintings, others like prehistoric Celtic objects. This indicates that there is a lot of room for implementing personalizing enrichments to provide an even better user experience (Section 3.3.1).

#### **4.1.6 LinkedCulture trial conclusions**

From these results, we can conclude that:

- About dimension: Generic information about an object, e.g. the century it is from with a link to the wiki page about that era, does not add anything meaningful for users.
- Related Artworks dimension: All participants enjoy viewing related art objects. It provides them with information about the context of the object, and Europeana has such a vast collection (30M+) that providing meaningful enrichments works quite well.
- Ordering dimensions: Besides 'About' in its current form not providing participants with the information they are seeking for currently, all other three dimensions do. It depends on the preference of the user which one they'd like to be presented with first and which they are most likely to explore in-depth.
- Be specific, and less is more: participants liked the most specific enrichments the best. They also indicated that they'd prefer to see less enrichments in a dimension, as long as they are closely related to the object.
- Make images even more prominent and bigger in the interface, especially in the Related Artworks and Related Fragments dimensions.
- Make clear why there is a relation between an enrichment and the art object, e.g. by indication whether the relation is based on the art style, creator and/or period.
- In general, the interface was received very positively. It is uncluttered and information is clearly presented. Only the grey-on-grey content was mentioned as a point of improvement.
- Provide a searching and browsing option, based on art styles, type of material and creator.

All in all, the participant responded very positively to LinkedCulture. If the relevance of the provided enrichments is improved and suggested additional functionalities are implemented, the application provides a big value to its users. Furthermore, the concept can be translated well to other programme formats according to the participants, indicating there is a whole market for LinkedTV to explore.

#### **4.2 LinkedNews scenario**

This section presents the results of the LinkedNews evaluation as they pertain to the particular motivations established in Section 3.2.1: Motivation. The analysis of the evaluation results is based on free comments and closed answers (check boxes, scales).

The feedback from the professional users involved in the evaluation of the system will be kept short here, because they will be analysed further in D1.6. Similarly, results pertaining to the personalization of content can be found in D4.7.

#### **4.2.1 End users – Perceived Added Value**

In order to put test users' feedback into a fair relation, the first questions circled around their general habits and interests. All test users confirmed that they often feel like looking up details and background information on the Internet while watching news (The calculated value was 2.01 on a scale from 1-6, where 1 meant 'very often' and 6 meant 'never'). Despite this general need, however, they would actually not automatically do so (3.0/6).

Comparing it with other TV programme categories, news was confirmed to be the one category where this need arose most often.

Participants attested to the added value of a service like LinkedNews and discussed it in very interesting ways. The most important aspect seemed to be the editorial guidance. Frequent Second Screen searchers immediately asked where the Search field was and put this service offer in relation to recent discussions on whether (public) media can be trusted. They stressed that they preferred a) a wider range of sources where the editors had decided not to offer links to non-public media; and b) that more choice or control of the selected media and online sources would be crucial. They did not want to leave the decisions on what would be relevant links to the LinkedNews editors.

In general, test users were very positive about the service. From the first questionnaire at the test introduction to the second round of questions, the general impression rate even improved from 1.8 to 1.3. One participant even stated that he was disappointed in cases where there was no extra content available and that he even started to miss it soon after the end of the trial.

#### **4.2.2 End users – Preferred usage scenario**

By coincidence it occurred that half of the test users were non-frequent TV viewers, two of them did not even have a TV set in their household. That did not mean that they did not consume broadcast content – they were frequent users of the on demand services and often even watched the available live stream. Their interest in HbbTV, however, was weak as it turned out that they used their PCs or tablets in a quasi-hybrid way, i.e. they were watching the live stream and doing Google searches in parallel on the same device. Still, the overall acceptance of the TV service was quite good (2.6/6) and the combined service (TV plus Second Screen) was rated as good as the tablet-only variant (2.0/6) and especially the screen sharing option, i.e. pushing content from the tablet to TV was largely appreciated.

#### **4.2.3 Professional users – Acceptance**

Many of the general ideas of the LinkedNews system were appreciated by the test participants. Especially the possibility to set time marks in a video and a player that would

play these segments from their start to their end marks was very welcome as nowadays any news video is offered in a) a complete version and b) a number of individual segments, each stored as an individual video file.

The possibility to enrich content by attaching links, however, was already possible from the CMS which manages the online services; only this was not used for coupling these enrichments with the video like the LinkedNews concept does. The current end result is a website with the embedded chapter video, a short description and a (very limited) number of links to related online sources.

The perceived added value of the suggested enrichments was not very high. It seemed that, although semantically correct, most of the detected entities were of little added value and many of the more important entities would not produce useful link suggestions. This was certainly a difficult task, because regional news would often feature people and locations that are not widely known. This in combination with the restriction not to link to non-public sources surely made it very unlikely that the system would produce a huge range of results. On the other hand, the editors knew about and located some sources that were available online (mostly at rbb-online.de) that the system did not find and suggest to the editor which caused both irritation and frustration.

#### **4.2.4 Professional users – Technologies**

Performance and robustness were major targets of criticism. In some cases it took longer for the system to find useful resources than it took for the editors to visit Google or the search engine of rbb-online.de. The most important criticism, however, was not technical but rather concerning the procedure: for each link that the system suggested the editor had to visit the original source and check how relevant it was, if at all. All in all, the editors felt that there was no gain in time or quality compared with their traditional procedure.

#### **4.2.5 LinkedNews trial conclusions**

In general, the trials supported the original service idea as a helpful and interesting service, even if some technical and editorial details were discussed heterogeneously.

The preparation of content, however, and especially the fact that the content, according to the LinkedTV strategy, has to be analysed prior to curation makes the LinkedNews Scenario less attractive. Although a live solution would be possible - in more cases than not the content is technically available a couple of hours before broadcast, so that curation could happen before broadcast and related curations could be triggered by Stream Events in the broadcast transport stream to be available on time for synchronous information – the perceived added value on the editors' side was not as strong as on the end user side.

## 5 Summary and Outlook

The motivation behind the WP6 Final User Evaluation was to test the core offering of our service: the enrichment of audiovisual content. Therefore, we designed two complementary tests, LinkedCulture and LinkedNews, so that users would be exposed to enriched television content in a variety of contexts. In both scenarios, we found participants to be highly interested in the enrichments and they validated the novelty and the added value of such an approach. They also demonstrated a keener interest in the ‘specific’ detailed content rather than the ‘general’ background information.

Additionally, in the design of our evaluation protocols, we took the opportunity to ask questions and evaluate the general usability of the LinkedCulture and LinkedNews applications. Many of these questions were focusing on navigational and organizational features of the interface, as these are areas where we received a great deal of feedback from testers one year ago during the evaluations described in D3.6. The general usability experience presented in the results of the current evaluation actually validates many of the design decisions and changes that were made from last year. In both scenarios, the navigation of enrichments and the dimensions used to organize enrichments were shown to be effective and also accommodating of a wide range interaction flows and user interests. This indicated that we have arrived at a design that is mature and is powerful enough to generalize across scenarios and contexts.

These findings are especially relevant when considering how interested and imaginative testers were when they were thinking of other contexts that would benefit from this service. Such contexts included sports, soaps, travel show, etc. and even some beyond traditional television programming such as medical purposes in a hospital. This suggests a potential future beyond scenarios of news and culture.

One of the more critical aspects of the LinkedTV experience is the generation of enrichment content. The LinkedNews test used participants (multimedia experts) in the role of editors to generate content while the LinkedCulture used internal project team members as editors. The LinkedNews editors had their daily time-sensitive curation efforts hindered by performance and robustness issues in the editor tool (especially when it was unable to make proper suggestions for content in a timely manner), while the LinkedCulture editorial team had a great deal of time and resources (comparably) to get the content right. End-users reported a positive perceived added value in both cases, but it is clear that linking users to ‘specific’ detailed related information leads to the best television experience.

## Appendix A: LinkedCulture Protocol

### LinkedCulture Trial Observation Protocol

**Date:** \_\_\_\_\_

**Participant's Number:** \_\_\_\_\_

**Participant's Number/Code:** *By giving each participant a number, we can anonymize personal data from the beginning. This number can be used also in the online questionnaire, so that we can always link both parts of the user feedback*

Technical issues to keep in mind before the participant starts with the test :

The LinkedTV application has to be *prepared* to start the test and should be set to the overview start screen with the three main episodes.

**TO BE PRESENT AT THE TEST:**

- Water / coffee / tea
- DOC: Protocol
- DOC: User assignment (NL)
- DOC: Consent form (NL)
- Tablet (with >80% battery life)
- Audio recorder
- Return envelope for travel costs
- Parking lot card
- Present
- Pen

**INTRODUCTION AND FILLING OUT FORMS (5 min)**

For full text, see [here](#).

- Present all the persons who are going to be present during the test and explain which role each one has and what is he/she going to do.
- Explain what the LinkedTV project is about and what we aiming for with this test.
- Explain why we're doing the test. (Focus not in application, but on organisation of information and enrichments you find interesting when viewing cultural videos).
- Explain what will happen, in which order and how long it will take. (4 assignments, interview, survey. Total: about 1 hour)
- Explain that the test is not an exam and that it cannot go 'badly'. We are testing the application, not the participants! If the tester doesn't understand something, this is not his / her fault.
- Explain that the tester will be observed and audio is recorded while he is performing the tasks and test.
- If the participant needs a break, this is always possible. If the participant wants to at any moment to finish the test, he/she can do this.

**Filling out the forms**

- Participant fills out the consent form and the administrative form to get back the costs for the test (in our case we are giving 20 Euros to each participant for the time and we reimburse the travel costs)

Before starting the test the user has to read out loud the short introduction to the scenario on the first page of the [assignment form](#).



# TEST

### ASSIGNMENT 1 – Look at the start screen (5 min)

Note: this is the first time the participant actually sees the application. The link the participant uses is their identifier (e.g. <http://pip.ia.cwi.nl/test/#/Test1/home/episodes>)

Question: Look at the start screen of LinkedTV and describe what you see and notice. Do not yet select anything.

## Observation protocol

1. What are the user's main comments?
2. On which information does the user concentrate?
3. Other remarks or observations.

**ASSIGNMENT 2 – Choose a fragment and watch it (10 min.)**

Indicate which fragment is the most interesting for you and why. Select this fragment, so you can view it. Talk out loud whenever you notice anything relevant or interesting.

When you've watched the fragment or a substantial part of it, select the 'Explore' button. After that, you will get your next assignment.

**Observation protocol**

1. Relevant remarks or observations.

**ASSIGNMENT 3 - Explore the information in the three categories (10 min.)**

Before you do anything, indicate what you see and notice in the 'Explore' screen. Then you are free to explore the content in 'About the artwork', 'Background', 'Related artworks' and 'Related chapters', but do not yet select another chapter. Talk out loud about what you notice and do and why.

**Observation protocol**

1. Impression of the way the information is presented.

2. Comments on the types of dimensions.

3. Comments on the enrichments.

4. Elements the participant does not understand.

5. Elements the participant misses.

6. Any other remarks or observations?

### ASSIGNMENT 4 - Browse through the application (10 min.)

Now explore the application as you want to. Tell us out loud what you do and notice and why. You can indicate when you are done, otherwise we will do so when the time is up.

## Observation protocol

1. Impression of the way information is presented.
2. Elements the participant does not understand.
3. Elements the participant misses.
4. Any other remarks or observations.

**EVALUATION - Evaluation form + interview (10min.)****Interview**

Did you find something specially valuable/attractive/innovative for you in the application?

What did you find the least interesting/attractive about the application?

Which type(s) of information did you find the most interesting: background, related artworks, related chapters?

Would you present the different types of information in a different way?

In which situation(s) would you use the application?

Who else do you think would use the application?

Did you miss anything in the application which could be valuable for you?

**Questionnaire**

<https://nl.surveymonkey.com/r/TKK2015BS>

***Thank you very much for participating in the test and this valuable feedback.*** If you would like to be informed about future version tests of this applications please tell us so we can add you to our pool.

*Interviewer name and signature:*

.....

*Observer name and signature:*

.....

## Appendix B: LinkedCulture Consent form

The following is a translation from Dutch to English of the text for the consent form used in the LinkedCulture trials according to the protocol detailed in Appendix A.

### **Consent form for participation in LinkedTV Interactive Documentary Trial**

I hereby confirm my participation in the Trial “Novel TV-applications” held in the context of the project LinkedTV.

I was informed by the LinkedTV researchers about essential research information and understand the scope of the research conducted by LinkedTV and the study “Novel TV-applications” in which I will participate.

I understand and agree that my responses will be documented and stored until the end of the study (latest until 31.05.2015). Specifically, my responses and actions will be written down, anonymised pictures will be taken, and the second screen will be filmed (audio and video) so that my interaction with the application is also documented. The documented information will be used exclusively for research purposes and deleted at the end of the study (June 2015).

My personal information will not be shared with third parties. My answers as well as all audio-visual documentation will not be shared with third parties as well, and will be anonymised both in external and internal documentations and publications.

This anonymised information and documentation may be used by Sound and Vision and the LinkedTV project without any further consent.

My participation is voluntary and I understand that I can stop the research “Novel TV-applications” at any time of my choosing and that I do not have to answer questions if I do not want to.

*Check if you agree:*

☐ I have read the consent form and I agree to voluntary participation by signing this consent form.

☐ I allow usage of audio, video recordings and photographs of this test as documentation of it. This documentation will only be used for reference by the researcher(s), and will be fully anonymised for both internal and public presentations and publications.

*You may withdraw your consent at any moment. You can contact Lotto Belice Baltussen ([lbbaltussen@beeldengeluid.nl](mailto:lbbaltussen@beeldengeluid.nl), 035-6771755), if you want to withdraw your consent after the trial.*

Date and Place: \_\_\_\_\_

Participant name: \_\_\_\_\_

Signature: \_\_\_\_\_

Researcher Names: \_\_\_\_\_

## Appendix C: LinkedCulture Questionnaire

The following is a translation from Dutch to English of the text for the consent form used in the LinkedCulture trials according to the protocol detailed in Appendix A.

1. In general, do you use mobile applications?

☐ Yes (go to question nr. 2)

☐ No (go to question nr. 3)

2. Please rate the statements below.

☐ The last app that I bought was: 1 = very cheap to 5 = very expensive

☐ The average price of the apps that I use is: 1 = very low to 5 = very high

3. Would you be willing to use the LinkedTV application if it was free?

☐ Yes, regularly for each episode

☐ Yes, from time to time

☐ No

☐ [+ optional text box with reason]

4. Supposed that LinkedTV appears next month in the app store: what is the chance that you would buy the application within the next 6 months?

☐ I am absolutely sure that I will buy the app.

☐ The chance that I would buy the app is rather high.

☐ The chance that I would buy the app is around 50/50.

☐ The chance that I would buy the app is rather low.

☐ I see absolutely no chance that I would buy this app.

Filter: Answers a), b), and c.):

5. How much would you be willing to pay for the LinkedTV app monthly?

☐ 1,99 Euro / ☐ 2,99 Euro / ☐ 3,99 Euro / ☐ 4,99 Euro / ☐ 5,99 Euro

☐ 6,99 Euro / ☐ 7,99 Euro / ☐ 8,99 Euro / ☐ 9,99 Euro / ☐ 10,99 Euro



## Appendix D: LinkedCulture Sign-up form

### Gebruikersonderzoek LinkedTV / TKK - 2015 - deel 1

#### Inleiding

Hieronder kunt u zich aanmelden voor een gebruikersonderzoek van het Nederlands Instituut voor Beeld en Geluid naar een tweede scherm-applicatie voor het AVROTROS-programma Tussen Kunst & Kitsch [1]. Deze applicatie is ontwikkeld binnen het Europese project LinkedTV [2]. Binnen de applicatie worden fragmenten uit het programma verrijkt met achtergrondinformatie, gerelateerde kunstwerken én andere fragmenten uit de geschiedenis van Tussen Kunst & Kitsch.

Iedereen vanaf 18 jaar kan meedoen, ongeacht of je een trouwe kijker van Tussen Kunst & Kitsch bent. Je hoeft enkel interesse te hebben in video's over kunst en cultuur en enige ervaring met het gebruiken van een tablet.

Het onderzoek wordt afgenomen door twee researchers van LinkedTV, en vindt plaats in Hilversum bij Beeld en Geluid. Het onderzoek duurt ongeveer een uur. De opzet van het onderzoek is als volgt: er worden een paar opdrachten voorgelegd waarmee u de ontwikkelde tweede scherm-applicatie test. Na het afronden van de opdrachten houden we een kort nagesprek en vult u een enquête in.

Beeld en Geluid gebruikt de resultaten van het onderzoek om binnen het LinkedTV project de ontwikkelde tweede scherm-applicatie voor Tussen Kunst & Kitsch te evalueren. De uitkomsten van het onderzoek worden volledig anoniem verwerkt.

De onderzoeken vinden plaats tussen 16-27 februari. U kunt ook aangeven als u deze data niet kunt, maar wel aan het vervolgonderzoek begin maart wilt deelnemen. Er is een beperkt aantal plaatsen voor dit onderzoek. We laten u uiterlijk 5 dagen voor de door u opgegeven data weten of u bent geselecteerd voor deelname.

Reiskosten worden vergoed (tot maximaal €15) en als dank voor het meedoen krijgt u een VVV bon van €20.

Mocht u nog vragen of opmerkingen hebben, neem dan contact op met Lotte Belice Baltussen (lbbaltussen [at] beeldengeluid.nl)

[1] <http://www.linkedtv.eu/scenarios/hyperlinked-documentary-scenario/>

[2] <http://www.linkedtv.eu/>

- ☐ Weinig: ik gebruik computers niet vaak en gebruik internet voornamelijk voor email en af en toe wat zoeken en surfen. Ik maak weinig tot geen gebruik van sociale netwerken zoals Facebook en Twitter
- ☐ Gemiddeld: ik maak regelmatig gebruik van computers en het internet, en kan mijn weg online goed vinden. Ik heb een profiel op een of meerdere sociale netwerken zoals Facebook en Twitter.
- ☐ Veel: ik gebruik mijn computer intensief en ben (vrijwel) iedere dag online, zowel op mijn pc/laptop als op mijn mobiele apparaten. Ik ben actief op een of meerdere sociale netwerken zoals Facebook en Twitter.

**\* 8. Het gebruikersonderzoek: Welke van de volgende locaties en tijden schikken u? (meerdere opties mogelijk)**

	Ochtend	Middag	Avond
Geen van deze data/ik wil me graag aanmelden voor het vervolgonderzoek eind februari/begin maart	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
maandag 16 februari	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dinsdag 17 februari	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
woensdag 18 februari	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
donderdag 19 februari	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vrijdag 20 februari	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
maandag 23 februari	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dinsdag 24 februari	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
woensdag 25 februari	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
donderdag 26 februari	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vrijdag 27 februari	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**\* 9. Het gebruikersonderzoek: Wat is het emailadres waarop we u kunnen bereiken om u te laten weten of u bent geselecteerd voor deelname? Wij zullen uw emailadres alleen gebruiken voor dit onderzoek.**

**10. Optioneel: Als u vragen of opmerkingen heeft kunt u deze hieronder kwijt.**

Hartelijk dank voor uw interesse! We laten u uiterlijk 12 februari weten of u bent geselecteerd voor deelname.

Klik hieronder op 'Gereed' om uw aanmelding te versturen.

Gereed

- |  |                                     |
|--|-------------------------------------|
| <input type="radio"/> 18-24 jaar                     | <input type="radio"/> Man           |
| <input type="radio"/> 25-39 jaar                     | <input type="radio"/> Vrouw         |
| <input type="radio"/> 40-54 jaar                     | <input type="radio"/> Geen antwoord |
| <input type="radio"/> 55+                            |                                     |
| <input type="radio"/> Wil niet zeggen, geen antwoord |                                     |

**\* 3. Algemene gegevens: hoe vaak kijkt u  
Tussen Kunst & Kitsch?**

- ☐ (Vrijwel) altijd
- ☐ Regelmatig
- ☐ Zo af en toe
- ☐ (Vrijwel) nooit

**\* 4. Algemene gegevens: hoe vaak kijkt u programma's of video's over kunst en cultuur?**

- ☐ (Vrijwel) altijd
- ☐ Regelmatig
- ☐ Zo af en toe
- ☐ (Vrijwel) nooit

**5. Algemene gegevens: op welke apparaten kijkt u televisieprogramma's of video's?**

- ☐ Laptop      ☐ PC      ☐ Smart phone      ☐ Tablet      ☐ Televisie

**\* 6. Algemene gegevens: gebruikt u wel eens een tweede scherm (b.v. smart phone, tablet) in relatie tot de televisieprogramma's die u kijkt?**

Meerdere antwoorden mogelijk

- ☐ Ja, om extra informatie over het programma op te zoeken (kan voor, tijdens of na uitzending zijn).
- ☐ Ja, om mijn mening te geven over het programma, bijvoorbeeld via Facebook of Twitter (kan voor, tijdens of na uitzending zijn).
- ☐ Ja, maar ik gebruik mijn tweede scherm om tijdens het kijken andere dingen te doen die niets met het programma te maken hebben.
- ☐ Nee

## Appendix E: LinkedNews Test Evaluation Protocol

### Protocol for the End User Trials

#### Face-to-face trials

#### Overview

1. Introduction
  1. Who we are and what we do, esp. what we do in LinkedTV
  2. The objectives of LinkedTV
  3. The procedure of this test (three phases, etc...)
  4. Explain Data Usage and Sign Consent Forms
2. Questionnaire #1
  1. Testers received a questionnaire with room for open feedback; host asked and explained the questions; testers wrote their answers/ticked their check boxes.
3. Demo as at Y3 review
4. Questionnaire #2
5. Explanation of procedure for longitudinal test

#### Introduction Protocol

##### Introduction to Service Concept

When you are watching the news you learn so many interesting new things, hear so many names that you may not have known or only remember vaguely.

Sometimes you hear about things or persons you remember only vaguely or do not know at all.

At that point many people would look up these names or topics, nowadays most probably using their smartphone or tablet.

But sometimes you find so much information and you may not always be able to distinguish useful from useless information.

Wouldn't it be nice to get such information directly in the service where you have been watching the news? And to be sure that what you find there REALLY relates to what you saw in the news?

That is the idea of LinkedNews!

##### What we are going to do now

1. General questions

2. Presentation
3. Feedback
4. At-home test

### Questionnaire #1: General Interest in News

1. How often do you watch news?  
⤴ 6 scale, daily <> never
2. When you are watching the news, how often do you fee like looking up details on the Internet - like names, locations or topics?  
⤴ 6 scale, never <>every time
3. How often do you actually look up such things that you are interested in?  
⤴ 6 scale, never <>every time
4. Do you do that more or less often when you are watching different things on TV?  
⤴ 6 scale, never <>every time
5. How often do you watch TV?  
⤴ 6 scale, daily <> never
6. Do you have HbbTV at home?  
⤴ Y/N

### Demo

- Presentation of HbbTV Service
- Presentation of Tablet App

### Questionnaire #2 First Impression

1. Your first impression of this service
  1. free text
  2. cross-check: What do you think of the TV interface/service?
  3. cross-check: What do you think of the Tablet interface/service?

### Explanation of Procedure of Longitudinal Test

1. Save and bookmark LinkedNews URL on desktops of test devices
2. Hand out and go through brief manual, incl. contact data for questions
3. Repeat schedule, esp. date of final interview

# Longitudinal Test

## Manual

1. Log in procedure
  1. Which login for which test person
  2. Why using the correct log in is important >> Profiling/Personalisation
2. Overview of Features
  1. Watch
  2. Thumbs Up/Down
  3. Explore mode
  4. Rate
3. Assigned Tasks

## Days 1-3

1. Please watch the news
2. Check all chapters; either skip through the chapters or watch them completely.
3. Please **click thumbs up/down** (at the right-hand slide down chapter menu) if you are interested/not interested in the chapter or, if you are indifferent, simply do nothing and skip the chapter
  1. thumbs up means that you "interested in more information" on this subject (or combination of subjects), not necessarily that you like or approve of what is being said!
  2. thumbs down means that you never want to see content about this subject (or combination of subjects) - i.e. a filtering service should filter out this kind of content for you.
  3. neglecting/skipping means you are not interested but neither have a strong objection about the subject (or combination of subjects).
4. Explore enrichments for interesting chapters while the video plays (it will pause for the time you take for exploring) or later. You can explore enrichments for a chapter by clicking the "Explore" button on the right-hand slide down chapter menu.
5. Click thumbs up/down (at the top-most right corner of the screen) to indicate preference for an enrichment, or do nothing (neglect) if you are indifferent about it. The thumbs up/down buttons mean the same as before (see 2a-2c).

## Days 4-5

On Thursday and Friday you will see a small change in the interface: Instead of Thumbs Up/Down you will see 5 Stars and also next to them a Reject button: at the top right of the screen of the enrichments view, and at the right-hand slide down chapter menu of the chapters view. Stars can be clicked on, denoting a scale of 1 to 5 stars from left to right. The reject button can also be clicked.

1. Please watch the news
2. Check all chapters; either skip through the chapters or watch them completely.
3. For each chapter, please **rate** it using the stars/reject buttons (stars: positive rate in a scale of 1-5, reject: negative rating), or if you are indifferent, simply skip the chapter.
4. Please explore ALL THE ENRICHMENTS of ALL THE CHAPTERS
5. For each enrichment please **rate** it.
6. Rating denotes how much you feel this chapter should have been recommended/not shown to you given your interactions (thumbs up/down, playing, skipping) during days 1-3.
  1. 1 Star will mean that this enrichment/chapter has little to no relevance to your interests as you think those should have been captured in days 1-3,
  2. 5 Stars will mean that this enrichment/chapter has nearly perfect relevance to your interests as you think those should have been captured in days 1-3,
  3. Reject will mean that this enrichment/chapter should be rejected (not have been displayed) for you based on your disinterests as you think those should have been captured in days 1-3.

## Final Questionnaire

### Questionnaire #3.1 - General Questions

1. You have been using this service for a full week now. What is your impression of this service?

- ⤴ free text
- ⤴ cross-check: What do you think of the TV interface/service?
- ⤴ cross-check: What do you think of the Tablet interface/service?

2. Do you think this is a value-added service?

3. Seeing both now, what do you think of the TV interface and the tablet interface?

Such a service would be interesting...

- ⤴ on the TV screen
- ⤴ as a combined service - TV AND Second Screen
- ⤴ as a tablet service (without connection to TV programme)
- ⤴ neither way

### Questionnaire #3.2 - Questions on Business Aspects

4. In general, do you use mobile applications?

Yes (go to question nr. 2 and 3)

No (go to question nr. 4)

5. The last app that I bought was:

- ⤴ Free
- ⤴ < 0,99€
- ⤴ 1€5€
- ⤴ >5€

6. The average price of the apps that I use is:

- ⤴ Free
- ⤴ < 0,99€
- ⤴ 1€5€
- ⤴ >5€

7. Would you use the LinkedTV application if it was free?

- ⤴ Yes, regularly for each episode
- ⤴ Yes, from time to time
- ⤴ No –



Please explain the reasons why you would not use the LinkedTV app (optional text box)

8. Supposed that LinkedTV appears next month in the app store, would you be willing to pay for it?

a) YES (go to question 6)

b) NO

9. How much would you be willing to pay for the LinkedTV app?

⬆ < 0,99€

⬆ 1€5€

⬆ >5€

### Questionnaire #4 - Questions on Personalisation

1. Would recommendation of content bring added value to the service?

⬆ Yes

⬆ No

⬆ I am not sure

2. Would you allow your interactions to be tracked so that the service can provide you content tailored to your preferences?

⬆ Yes, totally!

⬆ Yes, but only if I was aware about it.

⬆ Yes, but only if I was aware about it and I am able to see, edit and delete the information I send.

⬆ No, not at all, I don't like being tracked.

3. If you would allow interaction tracking, where would you prefer the information tracked to be stored?

⬆ Anyplace, I don't have a preference

⬆ On a server to be accessible always

⬆ On my own tablet/mobile/pc, I don't want my information to be available to a third party

⬆ As I stated before, I don't want to be tracked

4. Would you like to see indication of recommended chapters in a news show, so you can visit them first/go through them in more detail/skip chapters that might not be interesting?

⬆ Yes

⬆ No

⬆ I am not sure

5. Would like to see recommendation of related content to a chapter?

- ⤴ Yes, with an indicator that this content is of interest to me (e.g. “Recommended for you”)
  - ⤴ Yes, with an indicator that also shows how interesting the content is for me (e.g. 1-5 stars)
  - ⤴ Yes, not with an indicator, but content should be re-arranged (ranked), so the most interesting content would come first.
  - ⤴ No
6. Would you prefer if content that the system learned that you do *not* like be filtered out for you?
- ⤴ Yes, I don’t want to see it at all
  - ⤴ Yes in the case of related content, no in the case of news show chapters
  - ⤴ Kind of, I don’t want to miss any content, but if an indicator pointed out that I probably don’t like it, then I would go quickly through it or skip it
  - ⤴ No, I want everything to be on my plate